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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

VINH, LAN

ART UNIT PAPER NUMBER

1765

DATE MAILED: 11/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/976,316

Applicant(s)

BAE ET AL.

Examiner

Lan Vinh

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 November 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12, 15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/976316.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/12/2003 has been entered.

Claim Objections

2. Claim 15 is objected to because of the following informalities: In line 7 of claim 15, the term "sacnfical" appears to be a typographical error, the examiner suggests replacing "sacnfical" with --sacrificial--. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Offenberg (US 5,683,591).

Offenberg discloses a process for producing surface micromechanical structure. This process comprises the steps of: forming/stacking a layer 11 of polysilicon after forming a sacrificial layer to prevent adhesion (col 3, lines 49-60, fig. 2), the layer 11 is removed by dry vapor-phase etching (col 4, lines 36-37), which reads on stacking an anti-stiction layer that is operative to be removed by dry etching for preventing stiction after forming the sacrificial layer, the sacrificial layer is removed by etching fluid (col 4, lines 26-27).

The limitation of claim 2 has been discussed above.

Regarding claim 3, Offenberg also discloses that layer 11/anti-stiction layer comprises of photoresist (col 3, lines 65-66)

Regarding claim 4, Offenberg discloses that the sacrificial layer is silicon oxide (col 4, lines 4-5)

5. Claims 5, 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Hetrick et al (US 6,404,028)

Hetrick discloses a method for fabricating an adhesion-resistant microelectro-mechanical device. This method comprises the steps of:

forming a substrate 26 (col 5, lines 48-49), forming an AHC layer to reduce sticking/stiction on the substrate, the AHC layer can be removed by plasma etch/dry

etch (col 7, lines 41-44; col 8, lines 23-25), forming a sacrificial layer 36 (PSG) on the substrate, the layer 36 is removed by HF acid solution/ wet etching (col 7, lines 25-27), removing parts of AHC layer 42 and layer 36 to expose part of the substrate and forming a structure including a post as seen in fig. 8, forming a structural layer 42 over the structure (col 8, lines 1-3; fig. 10)

The limitation of claim 8 has been discussed above.

6. Claim 15 is rejected under 35 U.S.C. 102(e) as being anticipated by Hetrick et al (US 6,404,028)

Hetrick discloses a method for fabricating an adhesion-resistant microelectro-mechanical device. This method comprises the steps of:

forming a substrate 26 (col 5, lines 48-49), forming a release layer 44/anti-stiction on the sacrificial layer 36, the release layer can be stripped by oxygen plasma/dry etch (col 7, lines 57-59; col 8, lines 25-27), forming a sacrificial layer 36 (PSG) on the substrate, the layer 36 is removed by HF acid solution/ wet etching to release the microstructure (col 7, lines 5-27), forming a structural layer 40 on the release layer 44 (col 8, lines 1-3; fig. 10). Hetrick also discloses that the layer 42 formed on release layer 44 reduces sticking /stiction

7. Claims 9, 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Hetrick et al (US 6,404,028)

Hetrick discloses a method for fabricating an adhesion-resistant microelectro-mechanical device. This method comprises the steps of:

forming a substrate 26 (col 5, lines 48-49), lines 48-49), forming an AHC layer to reduce sticking/stiction on the substrate, the AHC layer can be removed by plasma etch/dry etch (col 7, lines 41-44; col 8, lines 23-25), which reads on forming an anti-stiction layer on the substrate, forming a sacrificial layer 36 (PSG) on the substrate, the substrate are coated with AHC layer (col 5, lines 57-60; fig. 9), the layer 36 is removed by HF acid solution/ wet etching to release the microstructure (col 7, lines 5-27), forming a structural layer 40 for forming one microstructure on the sacrificial layer 36 as seen in fig. 10. The microstructure is released as seen in fig. 8 of Hetrick.

The limitation of claim 12 has been discussed above.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 6-7,10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hetrick et al (US 6,404,028) in view of Offenberg (US 5,683,591).

Hetrick's method has been described above. Unlike the instant claimed inventions as per claims 6-7, 10-11, Hetrick does not specifically disclose forming the anti-stiction layer of polysilicon/photoresist.

However, Offenberg discloses a process for producing surface micromechanical structure comprises the steps of: forming a layer 11/anti-stiction layer of polysilicon/photoresist after forming a sacrificial layer to prevent adhesion (col 3, lines 49-60, col 4, lines 50-61), the layer 11 is removed by dry vapor-phase etching (col 4, lines 36-37).

Hence, one skilled in the art would have found it obvious to modify Hetrick's method by forming a anti-stiction layer of polysilicon/photoresist as per Offenberg because according to Offenberg the stiffener layer 11 made of photoresist etching more slowly which prevent the structure from being deflected and adhering and instead of photoresist, polysilicon is employed which etches slowly and without leaving residues in vapor-etching (col 4, lines 25-55)

Response to Arguments

10. Applicant's arguments with respect to claims 1-12, 15 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 703 305-6302.

The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 703 305-2667. The fax phone number for the organization where this application or proceeding is assigned is 703 872-9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-0661.



LV

November 25, 2003